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Tree Pest Leaflets

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THE BEECH SCALE

Cryptococcus fagi (Baer.) Dougl.

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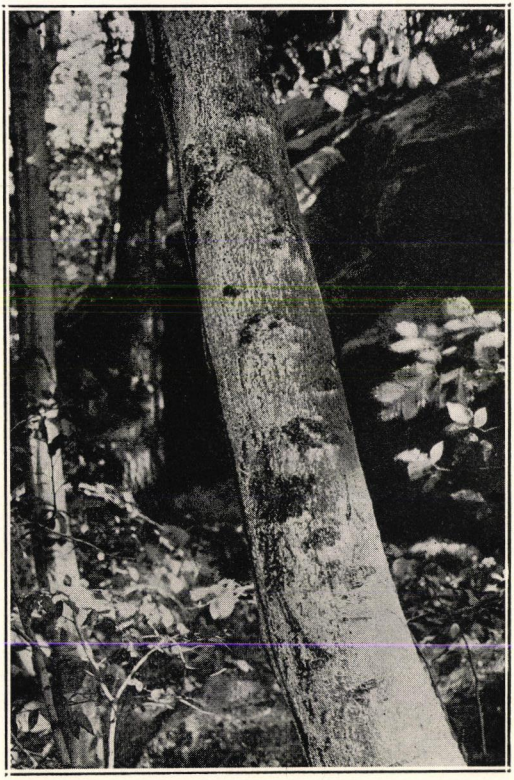

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History and Distribution.

The beech scale was first discovered in the United States in the Arnold Arboretum, Boston, Mass., in 1929. It has been present in Nova Scotia for at least 25 years and during that time a tremendous mortality of beech has occurred in the Maritime provinces of Canada as a result of scale attack followed by Nectria infection. At the present time the scale has been located in 57 towns in eastern and central Maine, in 3 towns in southeastern New Hampshire, in 14 towns near Boston, Mass., in Hartford, Conn., in 2 towns on Long Island, N. Y., and in 3 towns in Westchester County, N. Y. A considerable number of trees are already dead or dying in eastern and south-central Maine.

Host Trees.

The scale attacks the American beech (*Fagus grandifolia* Ehrhart) and the European beech (*Fagus sylvatica* L.) and its varieties.

Symptoms of Damage.

A light infestation of this insect appears on the bark as minute, white, woolly dots which may be isolated or may be massed to form thin vertical lines. As the infestation increases the dots increase in size and number until finally the trunk of the tree and the lower side of the branches may be completely covered with a white mass. (Fig.) The scale attacks the trunk, branches, and exposed roots of all ages of beech.

Injury.

In feeding, the scale inserts its beak into the bark for about 1.5 millimeters. Individual scales probably cause no appreciable injury but when colonies of several hundred per square inch are present the outer layer of bark is killed and becomes brown. When a tree is heavily infested, extensive areas of the bark are killed. When the bark is removed, it is found that the killing often extends to the cambium and occasionally the sapwood is discolored. If, for some reason

such as winter-kill, the scale infestation disappears, the tree often shows recovery by producing healing tissue around the wound, thus forming a depression or pit in the bark. Such pits are numerous, particularly on young trees in eastern Maine.

Life History.

In the vicinity of Boston, egg deposition begins about June 15 and reaches a maximum in July. Hatching begins about August 1, and crawlers are most abundant in August and September. When the crawler finds a desirable spot on the bark, it inserts its beak, becomes quiescent, and begins to secrete white woolly wax. The scale overwinters in this stage and completes its development the following spring. A mature female is nearly circular, from one-fiftieth to one-thirtieth of an inch in diameter. Eggs are deposited under the woolly covering. There is, therefore, one generation annually and reproduction occurs parthenogenetically, males of the species being unknown.

Means of Spread.

Distribution from tree to tree is accomplished largely by the wind, eggs and crawlers being borne in dislodged clumps of wool. Birds, squirrels, and insects may also aid in the dispersion of this species.

Natural Control.

Observations indicate that the beech scale is susceptible to low winter temperatures. During the abnormally cold winter of 1933-34, 95 percent mortality occurred above the snow line in many of the infested areas in Maine. Only one natural enemy of importance has been found in the United States. The predacious ladybird beetle *Chilocorus bivulnerus* Muls. was especially effective in Maine during the spring and summer of 1934, particularly where the scale population was reduced by the low temperatures of the preceding winter.

Artificial Control.

The impracticability of spraying large forested areas is recognized, but there is a need for controlling the beech scale by artificial methods in park and ornamental plantings. This insect may be controlled with a dormant spray of lime-sulphur, either the liquid form diluted at the rate of 5 gallons in 95 gallons of water or the dry

mixture used at the rate of 12 pounds to 100 gallons of water. Oil sprays should not be used indiscriminately on beech, since some brands are likely to injure the trees if applied in sufficient strength to kill the scale.

REFERENCES

Brown, R. C. Notes on the Beech Scale, *Cryptococcus fagi* (Baer.) Dougl., in New England. Jour. Econ. Ent., v. 27, no. 2, pp. 327-334. Geneva, N. Y., April 1934.

Collins, C. W., and R. C. Brown. Beech Scale Scouting Reveals Infestations in Four New England States. Yearbook of Agriculture, 1935, pp. 131-133. Washington, D. C., 1935.

Ehrlich, John. The Beech Bark Disease, A Nectria Disease of Fagus, Following *Cryptococcus fagi* (Baer). Canadian Jour. Research, v. 10, spec. no., pp. 593-692, 9 pl. Ottawa, Canada, June 1934.

Spaulding, Perley, T. J. Grant, and T. T. Ayers. Investigations of Nectria Diseases in Hardwoods in New England. Jour. For. 34: (2), 169-179, 1936.